

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-45 (canceled).

1
Claim ~~46~~ (currently amended): An element comprising:

a support having a thickness and a face;

the face having at least two pores extending through the entire support thickness and spaced from one another to define a node spacing, the at least two pores having a different diameter in the range of about 10 μ m to greater than about 20 μ m; and

a substantially fibrinogen-free non-hydrolyzed fibrin network in direct contact with the face and extending into at least one each pore a distance from about 2 μ m to about 20 μ m.

2
Claim ~~47~~ (previously presented): The element according to claim ~~46~~ wherein the support is substantially hydrophobic.

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Claim ~~48~~ (previously presented): The element according to claim ~~46~~ wherein the support has a thickness from about 0.1 mm to about 5 mm.

4
Claim ~~49~~ (previously presented): The element according to claim ~~46~~ wherein the fibrin network extends over the pores.

Claim 50 (canceled)

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Claim ~~51~~ (previously presented): The element according to claim ~~46~~ wherein the node spacing is from about 5 μ m to about 100 μ m.

6
Claim ~~52~~ (previously presented): The element of claim ~~46~~ wherein the fibrin network has a substantially uniform thickness across the entire face.

7
Claim ~~53~~ (previously presented): The element according to claim ~~46~~ wherein the fibrin network contains less than 1% by weight of unreacted fibrinogen.

8
Claim ~~54~~ (previously presented): The element according to claim ~~46~~ wherein the fibrin network contains from less than about 0.5% to less than about 0.1% by weight of unreacted fibrinogen.

9
Claim ~~55~~ (previously presented): The element according to claim ~~46~~ wherein the fibrin network contains no unreacted fibrinogen.

Claim 56 (canceled)

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Claim ~~57~~ (previously presented): The element according to claim ~~46~~ wherein the node spacing is substantially homogeneous and uniform.

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Claim ~~58~~ (previously presented): The element according to claim ~~46~~ wherein the fibrin network extends from about 10 μ m to about 20 μ m into the at least one pore.

12
Claim ~~59~~ (previously presented): The element according to claim ~~46~~ wherein the pores are free of fibrinogen.

13
Claim ~~60~~ (previously presented): The element according to claim ~~46~~ wherein the fibrin network further includes a first surface and a second surface.

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Claim ~~61~~ (previously presented): The element according to claim ~~60~~ wherein first surface is in contact with the support.

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Claim ~~62~~ (previously presented): The element according to claim ~~61~~ wherein second surface is stabilized by at least partial cross-linking to form a network of adjacent alveoli.

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Claim ~~63~~ (previously presented): The element according to claim ~~60~~ wherein the fibrin network is provided with cells.

22
Claim ~~64~~ (previously presented): The element according to claim ~~63~~ wherein the cells mediate cell-fibrin bonds.

23
Claim ~~65~~ (previously presented): The element according to claim ~~60~~ wherein the fibrin network is provided with proteins.

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Claim ~~66~~ (previously presented): The element according to claim ~~68~~ wherein the proteins mediate cell-fibrin bonds.

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Claim ~~67~~ (previously presented): The element according to claim ~~62~~ wherein the at least partially cross-linked fibrin network is 0.5 to 100 μm thick when measured in the dry state.

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Claim ~~68~~ (previously presented): The element according to claim ~~67~~ wherein the at least partially cross-linked fibrin network is 2.5 to 50 μm thick when measured in the dry state.

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Claim ~~69~~ (previously presented): The element according to claim ~~62~~ wherein the alveoli are formed between the cross-linked fibrin.

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Claim ~~70~~ (previously presented): The element according to claim ~~69~~ wherein the alveoli have a volume from about 5 μm^3 to about 25 μm^3 .

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Claim ~~71~~ (previously presented): The element according to claim ~~70~~ wherein the alveoli have an average thickness from about 1 μm to about 5 μm when measured in the dry state.

Claim 72 (canceled)

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Claim ~~73~~ (previously presented): The element according to claim ~~46~~ wherein the pores further comprise inner pore faces, the inner pore faces at least partially covered by a component selected from the group consisting of water-soluble or substantially water-soluble protein, and an organic additive.

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Claim ~~74~~ (previously presented): The element according to claim ~~46~~ wherein the fibrin network is at least partially covered by a water-soluble or substantially water-soluble protein.

Claim 75 (canceled)

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Claim ~~76~~ (currently amended): The element according to claim 46 ~~claim 62~~ wherein the ~~cross-linked fibrin network further comprises a~~ is at least partially covered by a water-soluble or miscible-polar additive.

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Claim ~~77~~ (currently amended): The element according to claim ~~76~~ wherein the ~~water-soluble or miscible-polar additive~~ is selected from the group consisting of glycerol, sugars, sucrose, glucose, mannitol and mixtures thereof.

Claim ~~78~~²⁹ (previously presented): The element according to claim ~~46~~¹ wherein the fibrin network has a moisture content of less than 0.5%.

Claim ~~79~~³⁰ (previously presented): The element according to claim ~~46~~¹ wherein the fibrin network contains fibronectin.

Claim ~~80~~³¹ (previously presented): The element according to claim ~~79~~³⁰ wherein the fibronectin content is from about 0.5% to about 15%.

Claim ~~81~~³² (previously presented): The element according to claim ~~46~~¹ wherein the fibrin network contains calcium.

Claim ~~82~~³³ (previously presented): The element according to claim ~~81~~³² wherein the calcium content is from about 1 μg to about 100 μg per cm^3 of the fibrin network volume.

Claim ~~83~~³⁴ (previously presented): The element according to claim ~~81~~³² wherein the calcium is calcium chloride.

Claim ~~84~~³⁵ (previously presented): The element according to claim ~~46~~¹ wherein the support further includes a second fibrin network superimposed on the fibrin network.

Claim ~~85~~³⁶ (previously presented): The element according to claim ~~84~~³⁵ wherein the fibrin network is in contact with the support.

Claim ~~86~~³⁷ (previously presented): The element according to claim ~~85~~³⁶ wherein the fibrin network contains alveoli.

Claim ~~87~~³⁸ (previously presented): The element according to claim ~~87~~^{84 35} wherein the second fibrin network contains alveoli.

Claim ~~88~~³⁹ (previously presented): The element according to claim ~~84~~³⁵ wherein the alveoli of the fibrin network have larger volumes than the alveoli of the second fibrin network.

Claim ~~89~~⁴⁰ (previously presented): The element according to claim ~~46~~¹ wherein the support is biocompatible and/or biodegradable.

Claim 90 (withdrawn): A method for producing an element, the method comprising placing a first porous portion of a support in contact with an aqueous solution and submitting a second porous portion of the support to a substantially uniform and homogenous suction force.

Claim 91 (withdrawn): The method according to claim 90 wherein the second porous portion is positioned opposite to the first porous portion.

Claim 92 (withdrawn): The method according to claim 90 wherein the aqueous solution contains fibrin.

Claim 93 (withdrawn): The method according to claim 92 wherein the aqueous solution contains fibrinogen.

Claim 94 (withdrawn): The method according to claim 93 wherein the aqueous solution contains water.

Claim 95 (withdrawn): The method according to claim 90 wherein the suction force pulls the water through the first porous portion.

Claim 96 (withdrawn): The method according to claim 95 wherein the suction force deposits a fibrin network on the first porous portion.

Claim 97 (withdrawn): The method according to claim 96 wherein the fibrin network is deposited substantially uniformly and homogeneously.

Claim 98 (withdrawn): The method according to claim 97 wherein the fibrin penetrates the first porous portion.

Claim 99 (withdrawn): The method according to claim 90 wherein the second porous portion is submitted to a pressure of less than about 0.8×10^5 Pa.

Claim 100 (withdrawn): The method according to claim 99 wherein the second porous portion is submitted to a pressure of less than about 0.5×10^5 Pa.

Claim 101 (withdrawn): The method according to claim 90 wherein a pressure difference is created between the first porous portion and the second porous portion.

Claim 102 (withdrawn): The method according to claim 101 wherein a pressure difference is at least 0.3×10^5 Pa.

Claim 103 (withdrawn): The method according to claim 101 wherein the second porous portion is intermittently submitted to a first pressure and a second pressure.

Claim 104 (withdrawn): The method according to claim 103 wherein the first pressure is less than about 0.8×10^5 Pa.

Claim 105 (withdrawn): The method according to claim 103 wherein the second pressure is less than about 0.8×10^5 Pa.

Claim 106 (withdrawn): The method according to claim 103 wherein the first pressure is at least 5% higher than the second pressure.

Claim 107 (withdrawn): The method according to claim 101 wherein the second porous portion is exposed to a temperature from about 0°C to about 100°C .

Claim 108 (withdrawn): The method according to claim 107 wherein the second porous portion is exposed to a temperature from about 15°C to about 60°C .

Claim 109 (withdrawn): The method according to claim 90 wherein the second porous portion is submitted to reverse osmosis.

Claim 110 (withdrawn): The method according to claim 109 wherein the reverse osmosis causes the diffusion of at least the solution water through the first porous portion.

Claim 111 (withdrawn): The method according to claim 90 wherein the solution contains from about 5 to about 20 mg/ml of fibrinogen-containing materials.

Claim 112 (withdrawn): The method according to claim 111 wherein the solution contains from about 0.01 to about 10 units of thrombin per ml.

Claim 113 (withdrawn): The method according to claim 112 wherein the solution contains from about 0.1 to about 10 units of factor XIII per ml.

Claim 114 (withdrawn): The method according to claim 113 wherein the solution contains from about 1 to about 40 millimoles of calcium chloride per ml.

Claim 115 (withdrawn): The method according to claim 114 wherein the solution contains from about 0 % to about 20% by weight of a water-soluble or miscible polar organic additive.

Claim 116 (withdrawn): The method according to claim 115 wherein the solution contains from about 5% to about 10% by weight of a water-soluble or miscible polar organic additive.

Claim 117 (withdrawn): The method according to claim 116 wherein the additive is glycerol.

Claim 118 (withdrawn): The method according to claim 90 further comprising:
a first step wherein the first porous portion is placed in contact with a solution containing fibrin and/or fibrinogen-containing materials;

a second step wherein the second porous portion is submitted to a suction force to diffuse at least the solution water through the thickness of the porous support and homogeneously and uniformly having penetration of fibrin or fibrinogen across the thickness of the porous support;
and

a third step wherein the fibrin and/or fibrinogen network is stabilized by at least partial cross-linking to form a network of adjacent alveoli.

Claim 119 (withdrawn): The method of claim 118 wherein the solution is in motion.

Claim 120 (withdrawn): The method of claim 119 wherein the solution contains a wetting agent.

Claim 121 (withdrawn): The method of claim 118 wherein the fibrin network is submitted to a washing step.

Claim 122 (withdrawn): The method of claim 121 wherein the fibrin network is submitted to a drying step.

Claim 123 (withdrawn): The method of claim 122 wherein the drying step is accomplished at least partially by lyophilization.

Claim 124 (withdrawn): The method of claim 123 wherein the drying step is accomplished at a temperature from about -30°C to about -100°C.

Claim 125 (withdrawn): The method of claim 124 wherein the drying step is accomplished at a temperature from about -40°C to about -70°C.

Claim 126 (withdrawn): The method of claim 118 wherein the fibrin or fibrinogen-containing materials have a controlled concentration.

Claim 127 (withdrawn): The method of claim 126 wherein the concentration ensures a substantially constant water diffusion through the support.

Claim 128 (withdrawn): The method of claim 90 wherein the support is biocompatible and/or biodegradable.

Claim 129 (withdrawn): The method of claim 90 wherein the porous portion is treated with an aqueous solution before contacting the fibrin and/or fibrinogen-containing materials.

Claim 130 (withdrawn): The method of claim 129 wherein the solution contains a wetting agent, a protein or a polar organic additive, or a mixture thereof.

⁴⁴
Claim ~~131~~ (currently amended): A filter including a membrane element comprising:
a support having a thickness and a face;
the face having at least two pores spaced from one another to define a node spacing, the at least two pores having a different diameter in the range of about 10µm to greater than about 20µm; and

a substantially fibrinogen-free non-hydrolyzed fibrin network in direct contact with the face and extending into at least one each pore a distance from about 2µm to about 20µm.

⁴¹
Claim ~~132~~ (previously presented): The element of claim 46 wherein the element is a membrane for a device selected from the group consisting of a bioreactor and a filter.

Claim ~~133~~⁴² (previously presented): The element of claim ~~46~~¹ wherein the element is an implant for a component selected from the group consisting of an artificial internal organ, an artificial vein, an artificial artery, an antithrombotic material, and a cardiac valve.

Claim ~~134~~⁴³ (previously presented): The element of claim ~~46~~¹ wherein the element is an artificial skin.